Industrial Finishing

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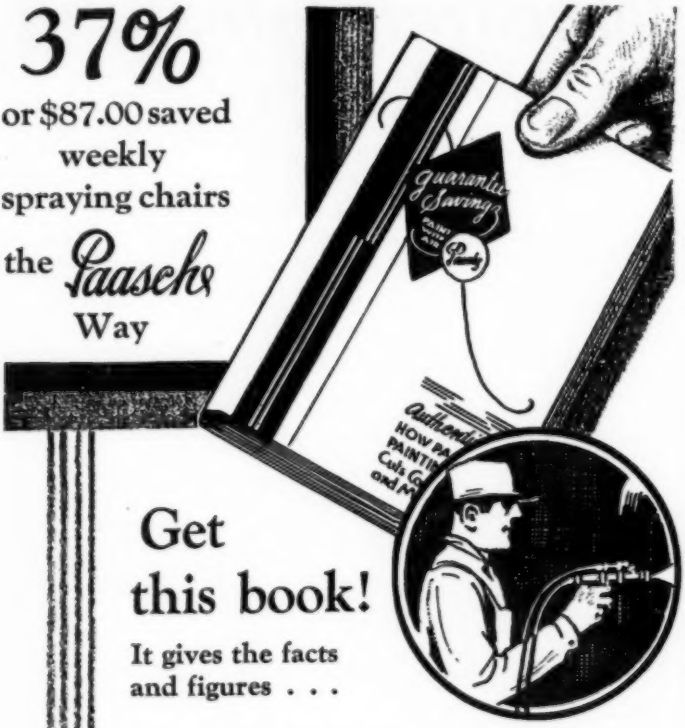

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From the Editor's Desk

ENTIRELY new products are being evolved, and old products in new finishes and marked improvements are being marketed. The period of struggle and sacrifice has focussed the attention of the healthy and hopeful on cost reduction methods, improved production systems, and better equipment. Wise executives have studied their product and its appearance. They have demanded new finishes—and gotten them. Products that really sell are being manufactured and sold by men who waste little time, thought or energy in thinking or talking "lack of permanence, unhealthy conditions" and "elusive prosperity."

* * * * *

MANUFACTURERS of finishing materials, equipment, and supplies, if you desire inquiries, here's a suggestion: Read carefully what appears in the editorial columns of INDUSTRIAL FINISHING every month, and then promptly advertise whatever is under discussion—if you have it.

After every issue our mail is heavy with inquiries asking where certain items mentioned or illustrated editorially can be obtained—for example, recently we received numerous inquiries concerning the following: Spray booth liner, synthetic gums and resins, decalcomania transfers, heat-resisting lacquers, lacquer filler, mixing lacquer, pearl essence, metal cleaner and metal cleaning equipment, non-grain raising stains, viscometer, "Dev" oak finish, pressed composition panels, conveying equipment, patching equipment and supplies.

Some of these inquiries—probably the majority—will mean the development of new accounts for those in position to supply what is wanted.

K. H. Rohr

Managing Editor

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How to Test the Lacquers You Consider Buying

By
P. H. POPE

Which of the various finishes offered to me is the best value? Defining best value as meaning the lowest finishing cost per unit for any established standard of quality, it follows that the best value is the material giving the minimum unit expense

THE PROBLEM of the small manufacturer of articles requiring a finish is exactly the same problem that the large manufacturer has to solve. The solving of this problem is not difficult for the manufacturer who has a testing laboratory. However, to equip and maintain a laboratory capable of testing finishing materials is quite costly. Only a concern whose output is large can really afford to add the cost of laboratory maintenance to the selling price of his product.

Until such a time as the manufacturers of finishing materials make no mistakes, and until the salesmen of these products are guided by knowledge and judgment, rather than by imagination and enthusiasm, it will be necessary for the manufacturer to protect himself as best he can. This article is written with the desire to show the manufacturer some methods of self-protection.

The starting point of any control work regarding quality as essential is to establish a standard of quality. Select a finishing material which from actual usage has given satisfactory results. Determine unit cost with this material. Determine total solid content, viscosity, gravity, durability and flexibility. If you are examining a pigmented or dye-colored material, find out its hiding power.

Other materials offered for sale should then be compared with this standard. Superior materials should be given a practical test to determine unit cost per finished article. New shipments from the regular source of supply can be checked to make sure there are no errors in manufacturing, and that uniform quality is being maintained. Costly refinishing can be avoided, quality can be improved, and the unit cost lowered by systematic testing.

The method of operation to be followed in conducting simple tests will be taken up in the order of their importance. The relative importance of each is a debatable fact; the following order is giving only the author's opinion: (1), durability; (2), total solids; (3), viscosity; (4), gravity; (5), hiding power; (6), flexibility.

Durability

Time and patience are the necessary requisites of this job. For the manufacturer, the primary thing is to get started. Build a rack, cut some panels from the wood or metal being used in production, finish them and place

them on the rack. That is the start; no results can be expected for a few months, but time rolls around surprisingly fast and soon comparisons can be made which actually tell you something.

If your product is used indoors, outdoor exposure does not exactly duplicate conditions; however in the large majority of cases the results are comparative. Since time of breakdown makes the greatest difference, therefore, in general, the racks should be placed out of doors, with the panels exposed toward the south and reclining on the rack at an angle of 45 degrees. Examine all panels every 30 days. Look for surface chalking, checking, lifting, discoloration and loss of luster. Use either the eye or a small magnifying glass.

Total Solids

Surely no farther away than second in importance is the determining of total solid content. This means the amount of material per gallon that is not volatile, that will not evaporate—which actually stays on the manufactured article. Except for the total solids, all other material in a gallon of lacquer evaporates into the air and is useful only as a carrier for the solid matter. Other things being equal, the lacquer with the greatest solid content is the most desirable, therefore, determine this for your protection.

Take a known weight of the lacquer to be tested, evaporate the liquids from this until nothing further will evaporate; until a constant weight is reached. This then, is your total solid content. Find the percentage of total solids as compared to the weight of the original sample. The equipment necessary includes a fairly accurate scale or balance and some evaporating dishes, which can be can-lids, glass tops of fruit jars or any flat shallow receptacle.

Testing Viscosity

This gives a useful and inexpensive check on materials coming in to your plant and serves as a daily test in your plant to keep dip or spray material uniform. For both clear or opaque materials, the least expensive equipment is known as a Ford cup. The No. 4 Ford cup is the one most frequently used.

To determine viscosity, it is only necessary to fill to overflowing this cup, meanwhile holding a finger over the bottom aperture; release finger and time the number of seconds required for the cup to empty itself. These cups are standard as to size of aperture and as to contents. They can be procured from any good scientific instrument house. A cheap stop watch is desirable. Keep temperatures comparative.

Specific Gravity

To maintain uniform material in the plant and to assure specified material from the source of supply, this test is advised. Specific gravity hydrometers are now well known. Prohibition and testing automobile radiators for alcohol have brought this useful instrument to a justified popularity. There are two kinds, one for liquids lighter than water, and another for liquids heavier than water. Secure the type that fits your present material and check both incoming material and the lacquer ready to use in your own plant. As a general rule, the greater the gravity of incoming material, the better the value—all other things being equal.

Hiding Power

This can only be done with expensive equipment, or else in a comparative manner. Believing the comparative method will prove of more universal use to readers of this article, it will be the only method described.

Take samples of the same specific gravity. Dip into these samples small panels of glass; ordinary clear window glass will do. After drying, hold to the light; the difference in hiding power can be easily seen. The value of this is apparent, as better hiding power means lighter coats and a correspondingly lesser cost.

Flexibility

Bending tests are the easiest and most reliable for our needs. Keep as standard, something which the panels can be bent around. A ¼-in. steel rod is good. Wood panels require different methods. This film can be tested for flexibility by dropping a standard weight from different heights.

The writer, a chemist by training and a salesman of finishing materials by choice, feels that it is advancing the industry if in any way he has helped to show the user what constitutes good finishing material. Poor material needs testing, good material deserves testing. Only by such methods can quality manufacturers offset the price advantage of cheap products. Unit cost often proves high-grade material to be the least expensive. May I repeat, poor material needs testing, good material deserves testing.

Condemns Art Moderne

The writer has had some part in making furniture for 40 years. He has designed and helped build several million dollars worth of furniture, pulpits, chairs, saloon fixtures, tables, bedroom furniture and office desks. He has worked on monstrosities, and on furniture as beautiful as a maiden's dream. He is getting on the shady side of life, yet is trying hard to keep in step with modern ideas, does not wish to be contemptuous of new ideas or jest about things he does not understand, but say, just what is "Art Moderne"?

One gets the idea from most of the stuff shown, that is, pictures of naked women hardly distinguishable from frogs, bathtubs corrugated on the inside and coffin-like on the outside. Lighting fixtures that look like eels with silk hats and tallow candles. Furniture, like soap boxes piled one on another or blocks piled on the nursery floor by a two year old.

Squares, triangles, cubes, circles, do-dads copied from Maya temples and Egyptian tombs. Rooms so modern that when one enters he is not sure that he is drunk, crazy or just dizzy. That is about the idea the common herd get from the so-called Moderne decorators.

Why build chairs with 30-in. seats from front to back; backs 60-in. high; gas pipe furniture painted a sickly green; furniture that is a cross between a bookcase and a folding bed; office desks with tops so thin that they bend when one leans against them; gas ranges decorated like mummy cases?—Arley E. Jones.

Chicago Furniture Show in June

In accordance with a unanimous vote by the Board of Governors of the Mart, meeting in the Furniture Club of America on January 13, the Summer Market at the American Furniture Mart, Chicago, will be held for two weeks—from June 1 to June 13, inclusive. The board definitely announced that there would be no May market nor July market held at the American Furniture Mart.

Furniture Show Finishes

By
R. G. MEADE

Back to Period designs—Early American and Duncan Phyffe in honey-maple and mahogany, Sheraton in satinwood, Jacobean and Elizabethan in oak, Queen Anne and some Early American in walnut. Wicker, porch and breakfast room furniture, of course, appear in attractive colors

IN JULY of last year an inspection of the exhibits at the Chicago Furniture Mart called forth a question as whether American furniture in the medium class might not be in the way of becoming standardized. And viewed again January 1931, it may be well and safely said that if not standardized, at least finish and design have become definitely conservative.

Thus the Jazz Age may be identified in future history as having reached its high point in the decade 1920-30. We had our dance and while we pay the fiddler we may expect the nation's mood to express the inevitable reaction in furniture as well as in finance. And what is the conservative influence in furniture? And how is it most likely to express itself?

The answer will be found chiefly in a return to the older period designs with a close approximation of the finishes originally used in connection with them. Five years ago you could have searched the building almost in vain for anything approaching a pure period design. This January there was scarcely a space which did not show at least one and in many cases, more.

The Period Revival

MAPLE is increasing in popularity and in greater variety of veneer cutting than birdseye and curly alone. Fussy designs have given way entirely to either Early American, Duncan Phyffe or French Provincial, of which more anon. Shading has disappeared and the body color is a warm honey tone which may best be described as warm brownish yellow. An increasing amount of maple is polished, though not of course, in Provincial which is also executed in birch.

MAHOGANY remains true to Colonial, that is American Empire, or to Duncan Phyffe, which is its finest expression. Crotch grain veneer continues popular for fronts with straight grain for tops and sides, but the color has settled on a rich reddish brown which is neither the old "antique" brown nor the very recent tone of orange or ruby red. Much of it appears in a high polish—practically all tops are so treated and varnish is preferred to lacquer.

SATINWOOD, in line with the trend toward the time honored periods, appears here and there without admixture with other veneers, Sheraton being the favored design. The finish is natural with probably one coat of varnish, rubbed and somewhat polished, over shellac and no shading.

OAK, whose revival had gained such headway in July, has somewhat receded in popularity due to its failure to find a public following in the bedroom field. It

appears in the purest of Jacobean and Elizabethan designs, melon bulb leg turnings, flat medallion carvings and all. At the same time the range of tone in finish color, frankly experimental in July, has narrowed to a blackish brown, highlighted by means of a wiping stain almost to the bare wood revealing the natural color. The finish is practically a dead flat, executed in either flat varnish, wax or flat lacquer.

WALNUT alone has held out against the period revival, although it appears scatteringly in Early American, Queen Anne and even French Provincial. In the main it continues to offer as nearly a "Modern American" style as can be conceived of apart from the prematurely boomed Moderne. The style is a commingling of various fancy veneers with butt and burl walnut and gumwood, all strikingly different in coloring but drawn together by means of shading stain at the borders. The color treatment of the walnut and gum is a medium brown, neither light nor dark, and a dull rubbed or polished varnish finish.

Bedroom Furniture

In the bedroom lines maple and mahogany in Early American designs are giving walnut a decided run for its money, particularly the increasingly popular "spool bed," the distinctive characteristics of which have also been carried out in dressers, chifforobes, vanities, benches and chairs.

As previously mentioned, oak failed to achieve popularity in this field; birch appears in the French Provincial style, finished a dark honey color, heavily highlighted with a wiping stain and darkened in the characteristic scroll vein lining. The finish is flat lacquer, very dull, or shellac and wax. Flat carving, usually in conventionalized fruits and leaves, is also wiped dark in the recesses.

Enamel furniture apparently finds little demand and, where shown, exhibits a standardized ivory and light green color combination executed in lacquer enamel and decorated very slightly with decalcomania floral designs, all unshaded.

The same colors and two-tone orchid also appear in the metal bed lines, where however, they seem to have a value chiefly for show purposes. The real demand is for grained effects in the plainer walnut, with a transparent bakelite top coat instead of regular baking varnish or clear lacquer.

Dining Room Furniture

Here in the dining room field oak is seen at its strongest, not in period adaptations but in pure Elizabethan and Jacobean with worn, highlighted edges, darkbrown colors and dead flat finishes. There is also some mingling with walnut in harmonizing color and with some shading rather than highlighting.

One outstanding maple suite in French Provincial design, hand carved in relief with flower and fruit patterns was stained a nut brown color with a tint of yellow, shaded and wiped a dark brown in all recesses. The finish was a dull, flat lacquer.

An Early American maple suite in the same space was finished in an unshaded honey color with curly maple tops and antique map designs on paper glued to the upper back interiors of the servers. The finish was dull-rubbed gloss lacquer.

Duncan Phyffe in reddish brown has the call among the mahogany suites, which are numerous and appear in polished varnish or lac-

quer. No new colors or designs of note were seen in the walnut suites except for the Early American note here and there, and a crotch walnut front on a china cabinet. Shading is definitely out of the picture and a polished varnish finish generally prevails on tops.

Living Room and Novelty

More oak, and that in antique carved and highlighted effects appear in the upholstered lines, where however but little wood is permitted to show. Antique oak is also more widely shown in the novelty lines and all in dark tones suitable to Elizabethan designs. Early American maple and mahogany are also featured with considerably less walnut, no painted work or decoration.

Wicker; Porch; Breakfast Room

In the fiber reed and willow lines the change is more pronounced in design than finish, the latter featuring bizarre shapes in natural or in two colors, for example tan and yellow or black and red; the former in two-tone mottling is seen on solid table tops.

Porch furniture features Chinese red, blue, green, tan and yellow, bakelite phenol protective finishes being favored over lacquer enamel.

Breakfast room suites favor subdued colors such as natural shaded in brown, gray with blue, ivory with green or natural and a stencil decoration in one of these colors. Frosting has disappeared, although oak is still the favored wood and gloss or flat lacquer have won out against varnish. Kitchen cabinets follow the same rule as the breakfast room suites, and refrigerators have returned to white with occasional trimming in green to furnish a bit of decoration.

Tilts Drums Easily

At the Safety Congress held in Pittsburgh last year, my attention was drawn to a tilter which was particularly designed for handling heavy drums of material, such as finishing materials, etc. One man can load a heavy drum on this device with ease; it cannot possibly slide away from him. But what arrested my attention in particular was the fact that after it was mounted, the drum could be easily rotated in its setting. Thus the bung could be turned directly downward, and the last bit of material drained from the drum. Incidentally, there was plenty of clearance underneath for the placing of a receptacle, into which the drum's contents could be drained. No danger of a man rupturing himself handling a drum with this device. Rollers under it made it rotatable.—S. L. F.

G. D. Brainard to Represent Dolan in South

Mr. Gordon D. Brainard has been employed by the V. J. Dolan & Co., of Chicago, to represent the Dolan company in the High Point, N. C., territory.

Furniture Club Elects Officers

For the first time a representative of the retail division of the furniture industry became president of the Furniture Club of America when A. F. Lilley, head of the furniture department of the Boston Store, Chicago, was elected to the position for the year 1931. A. G. Harden, president of the Harden Sales Co., retiring executive of the club, turned the office over to Mr. Lilley at a meeting of the board of directors, held on Jan. 12 in the club's quarters on the top floor of the American Furniture Mart.

Harold Coffey, president of the Kent-Coffey Mfg. Co., Lenoir, N. C., was elected vice president. Lawrence Whiting, chairman of the board of directors of the American Furniture Mart, was reelected treasurer; and George W. Rowell, Jr., secretary-manager, was reelected to serve until April 1, when his retirement from active business, announced at the meeting, becomes effective.

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Color Standardization

By
B. P. MILLAR

Color standardization is sadly needed; or more definitely, standardization of color names is something that we should have. It is an enormous job, and will take years to achieve understanding, but applied intelligently it should be of value in production and in sales problems

In view of tremendous interest being shown by industry in color and design, I believe that readers of INDUSTRIAL FINISHING *will be interested in this article relative to color simplification.*
—THE AUTHOR

BY COLOR standardization I do not mean to advocate any limitation of the number or character of colors to be used by industry. What I do advocate is the adoption of a standard method of color nomenclature. For example, the term "Nile Green" should represent a single color the country over; industry, individually and collectively, would profit by a common understanding of the term "Nile Green."

This is far from the present situation however. There is no standard for the term "Nile Green." For example, the various color cards of a single manufacturer show 11 distinctly different shades of green, each labeled "Nile Green." Recently a show window, in a large department store, entitled "Nile Green in the Kitchen" showed 27 shades of green on various utensils displayed. How can those responsible for color respond to a request for Nile Green when such ambiguity in color shades exists?

The following may be noted as being among the contributing causes to this condition: Mainly the difficulty experienced in reproducing sensations to color is held responsible. Ivory, for example, is one of the most confused of color names. There are relatively few persons who are acquainted with the actual color of ivory—and the actual color of ivory is by no means constant, being dependent upon its age and source.

It is because of such situations as this that individuals form an impression of what they believe is the correct shade to be called ivory and, being human, that shade is representative to the exclusion of all others. As a result, there is difficulty in finding anyone who can state authoritatively that such and such is the true shade of ivory.

Consequently manufacturers of color, when preparing color cards, having no criteria to use, merely lay down what they consider is the proper shade—or merely some shade that happens to be convenient—and dub it "Ivory" or "Nile Green" or "Colo-

The research of manufacturers of color has given us a greater number of pigments of a permanent character, which has enlarged our color range, making possible a greater number of colors than ever before.

"5856 SOLVENT"

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NON-GRAIN RAISING *for* WATER-SOLUBLE ANILINE STAIN POWDERS

The first new practical development in the field of wood finishing in the last 50 years. Dissolves water-soluble aniline stain powders as readily and completely as does water. Does not raise the grain. Does not bleed under shellac or lacquer. Makes a stain as fast to light as regular water stain.

Try this remarkable solvent with these latest shades

4791 WALNUT BROWN
4794 ANTIQUE PROVINCIAL

Write for samples and full information.

WOOD SPRUANCE QUALITY FINISHING PRODUCTS

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Offices — Works — Laboratories

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nial Yellow," as the case may be. With some hundreds of companies engaged in manufacturing color in different forms, is it any wonder that confusion exists?

There have been in the past few years a number of developments which tend to lead towards, and to make easy simplification of color names. Perhaps the most important of these was the development of a system of permanently and accurately identifying color. This method was developed by the late Mr. A. H. Munsell who, after many years of study, built up a color chart out of which has grown the present Munsell Color System, and the Munsell Color Book, which are being issued by the Munsell Color Co., of Baltimore, Md. This system provides a logical numerical notation for every conceivable color, and is fundamentally sound and adequate to meet the need for a practical working system of color notation.

The American Society for Testing Materials has, after several years of study announced a method for measuring and recording colors permanently, a method which eliminates the variable human factor, and permits of recording in the form of a pen and ink graph. There are a number of spectrophotometers developed for carrying on this work, which provide a ready means for simplifying this color question.

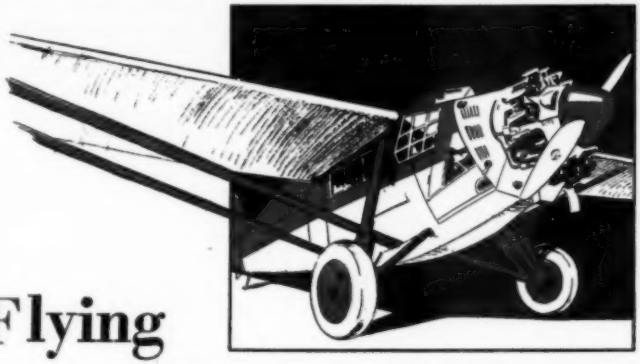
A number of color arrangements have been developed, among them the volumes of Chevreul, Ridgeway, and very recently the "Dictionary of Color" by Mearz & Paul.

The United States Textile Color Card Association has shown what can be accomplished in the way of simplification if approached in a solid, practical and definite manner. Its work along these lines has been of immense value to the textile industry, and the organization has greatly enlarged its scope since its inception in 1915. The work has shown that simplification does not mean limitation or hindrance of development work, but that it is possible to definitely identify color with benefit to all concerned.

In the past year we have seen at least two important movements started on the road to simplification, one the exhibit and organization started through the medium of the Pharmacopoeia Convention in Washington, D. C., and the other the conference sponsored by the Herald Tribune Institute, resulting in the formation of a committee under Dr. H. H. Sheldon to carry on this work.

Industry has gained much through the use of color, and it has undoubtedly suffered a little, but its eyes have been opened, and it is beginning to realize that there must be some systematic method for naming colors which will be constant over a period of time.

How many realize how rapidly colors change? Color cards, color chips, wet paint samples all change in hue, or in value; some within a few minutes; others over a longer period of time. In addition, it has been shown that individuals do not react identically to the same stimuli of color. Two individuals may and probably do see the same color in different ways but, owing to a lack of language, it is not possible for them to describe what they see. And again, raw materials, pigments,



Flying colors that stand the gaff

Intense heat—freezing cold—pounding hail and scouring wind give airplane finishes the acid test. In this field, as in every other, Sherwin-Williams has perfected finishes to master these exacting factors. New standards of visibility, durability, smoothness of texture and richness of color have resulted. The combination of S-W Nitrate Dope, Semi-pigmented Dope and Aero Finish gives a flexible surface light in weight and strong in protection.

Write for "Airplane Finishing Specifications." The Sherwin-Williams Co., Dept. 708, Cleveland, Ohio.

SHERWIN-WILLIAMS AERO FINISHES

For Planes, Hangars and Equipment

etc., seldom run uniform even in the finest plants. The individual who can look at a color and reproduce that color upon call, within reference to the original, is a fortunate one indeed.

Remembering how color cards, and color chips change color, it is a wonder that color manufacturers supply batches of color as closely matched as they do.

There is, without a doubt, a real need for an all-inclusive color simplification plan and standardization movement, and for an organization to carry on that work. Manufacturers should do all they can to help along this work by applying a common system of nomenclature to their particular standard colors, and by adopting standard color names as they are laid down, and using pen and ink graphs to record permanently their standards—instead of adhering to the obsolete method of a wet sample or color chip . . . . so subject to change.

This does not mean that they should in any way limit the number of colors which they use, but merely that they use a common language which will be understood by themselves, their color supply house, and their customers.

Aircraft Finishing

Among the materials used in finishing wood and metal parts of airplanes are metal primers, spar varnishes, raw linseed oil, heat-resisting and acid-resisting enamels, pyroxylin enamels, aluminized spar varnish and others. The use of aluminum in these finishes increases their salt water resistance.

Steel for aircraft is generally used in a sandblasted condition to provide a tooth for the later coatings of finish. Brass and bronze are usually cleaned by the dip method. Aluminum alloys are not sandblasted. Heat treatment of aluminum very markedly affects its resistance to corrosion.

The tubular parts of the structure are generally finished by dipping open tubes in linseed oil, while hollow tubes are drilled and the oil is forced in, then drained and the holes are filled with screws.—M. R. Whitmore.

Large Pressure Containers

The finishing field continues to advance, both in point of importance in the industrial realm and in the matter of better equipment. Production on a large scale need not fuss around with anything that will not deliver the goods. There are in use in some of the industrial plants pressure tanks of 60-gallon capacity, which will remain tight at 100-lb. air pressure. It makes a lot of difference, in these places, whether the time is being spent in spraying or in refilling containers.

James B. Day & Co's. N. Y. Representative

R. K. Stephens has been appointed New York representative of James B. Day & Co., Chicago, with headquarters at Syracuse, N. Y. Mr. Stephens was formerly with Pierce & Stevens, Buffalo, N. Y.

Paint Manufacturer Loans Spray Equipment

According to a circular released by the The Vortex Mfg. Co., 1978 W. 77th St., Cleveland, Ohio, manufacturer of paints for interiors, this company now loans its customers a modern paint spraying outfit to apply paint purchased from them to interior walls and ceilings. The Vortex Co., states: "We loan you this equipment; you cannot rent it; you cannot buy it. It doesn't cost you a cent for its use, you pay only for actual paint used."

10 good, substantial reasons for using this superior product

The fact that hundreds of concerns have used thousands of barrels of Murphy Flexible Lacquers is impressive, to be sure, but unless these materials can serve *you* in better work or greater profits, or both, you probably don't care who uses them.

What can Murphy Flexible Lacquers do right in your own finishing problems? Read over very carefully the 10 points given at the right. As you read them, apply the characteristics of these materials to your problems. Doesn't it seem more than likely that these Murphy *Flexible* Lacquers can do your work better, cheaper or quicker than varnish or nitrocellulose lacquers?

If you even *suspect* that it may be so, by all means get in touch with us for further information on your specific problems or for a demonstration.

MURPHY VARNISH COMPANY
Newark Chicago San Francisco
Essex Varnish Company, Newark
(Associate Company)
Baking Material Specialists

1. The basic ingredient of Murphy Flexible Lacquers is not nitrocellulose, but is radically different from ordinary lacquer.
2. They have a greater depth of film and build far better than ordinary lacquer.
3. We have never seen, even with varnish, a polish of higher brightness. And, unlike lacquer, the finish increases in clarity as it ages, instead of fogging.
4. Instead of chalking and checking as ordinary lacquers do, Murphy Flexible Lacquers actually toughen with age.
5. Murphy Flexible Lacquers, as their name implies, are like varnish in having the plastic resistance to the expansion and contraction of wood —a notable failure of the rigid finish of nitrocellulose lacquer. They are unaffected by humidity checking, so much deplored in lacquer.
6. They give the appearance and "feel" of varnish, instead of the cold, glass-like surface of lacquer.
7. Murphy Flexible Lacquers are entirely waterproof.
8. Murphy Flexible Lacquers dry as quickly as lacquer, but build more like varnish.
9. They are more durable than either varnish or nitrocellulose lacquers.
10. They are designed for both interior and severe exterior service on wood as well as metal.

Murphy *Flexible* Lacquers

Tumble Finishing — I

By
R. J. FAIRBURN*

First installment of a 2-part article that explains the tumbling process of coating and polishing small parts, reveals what work is adaptable to this method of finishing, and supplies practical information about consistency of materials, correct temperature, tumbling time, troubles encountered, etc.

THE CHIEF MERIT of finishing small wooden parts by tumbling is economy in the application of the finishing material. This method also produces a durable finish, as it forces the finishing material into the surface of the wood until it seems to become a part of the wood; therefore rough usage will not cause the finish to chip. A splendid depth of tone and richness of finish are readily obtained by tumble finishing.

It is true that there are mediocre tumble finish jobs which are not at all satisfactory, but there is no excuse for this. If a good tumble lacquer or enamel is used and the operator really understands his job, the result will be pleasing to the eye.

What Tumbling Is

Briefly, the tumble method of finishing is to half fill a suitably constructed tumbling barrel with the parts to be finished. A small quantity of tumble finish is poured over the work and the barrel is slowly revolved. The finish is forced into the pores of the wood, getting a firm hold on the wood surface and covering it with a thin, durable film. This article treats entirely of air-dried lacquers and enamels to be used in a horizontal barrel.

What Can Be Tumbled

Almost any small, symmetrical, wooden article may be successfully tumble finished. Some irregularly shaped objects may be tumbled, so long as they are constructed in such a way that no damage will be done by the tumbling. One concern making wooden erector sets for children successfully tumbles flat strips 3/16x1½x12-in. They have no trouble with the pieces sticking together, and they obtain a finish that has the durability so desirable in work of this character. Wooden beads, tops, yo-yo's, handles, and similar pieces are regularly tumbled. One concern tumbles handles for cross-cut saws and hack saws, and another tumbles 3-in. wooden letters that are ½-in. thick. Many similar items that manufacturers once thought could not be finished by tumbling are now being successfully finished in this way.

Kinds of Wood to Tumble

Attempts have been made to tumble finish articles made of rubber, metal and fiber, but to my knowledge no one has yet successfully tumbled such items. This, of course, is entirely apart from metal buttons and similar items that have, for many years, been tumbled in baking japans and enamels.

*With Brevolite Lacquer Co.

NO STRINGS
tied to this offer

When we offer you "free studio service" we *mean* just that. No obligation, either.

Oh! We'll be frank about it—our ultimate objective *is* to sell finishing materials. But we prefer to sell them on merit determined by the results they produce. And how better could we prove that merit than by finishing sample pieces for you?

So don't hesitate to commit a trial job or two to our finishing experts. For their own good they'll do their best to create a finish that is distinctively your own. You, of course, will be the final judge of its worth.

There are no strings tied to this offer.

The

ROCKFORD VARNISH
Company

ROCKFORD, ILL.

Smooth, white woods are best suited for tumble finishing. Soft wood, such as pine, is sometimes used, as are also the darker streaky-grained woods. However, it is considerably more difficult to obtain a good finish on woods of this type. This is not characteristic of tumble finishes alone, as anyone will agree who has ever attempted to get a good one-coat dip or spray finish on dark, streaky-grained woods.

Tumbling Equipment

The only equipment needed is a wooden barrel of solid construction mounted horizontally on trunnions. It should be equipped with a motor, pulley line or other means that will steadily revolve the barrel at approximately 25-r.p.m. An ordinary, round barrel is often used. It should be fitted with a removable section or door for loading.

The horizontal barrel will prove more satisfactory if it contains longitudinal cleats inside. The cleats help carry the objects being tumbled farther up the side walls, thereby creating greater tumbling action. For work that is inclined to stick together, it may be necessary to put baffle plates in the ends of the barrel. A barrel of this type may be constructed and mounted at a minimum of expense.

A typical tumbling barrel for satisfactory service has eight sides, each side being approximately 12-in. wide by 4 or 5-ft. long. One side is fitted with a removable loading door. These flat sides carry the work almost to the top of the barrel before it tumbles back.

With any type of barrel it is necessary to have a screen door that will be interchangeable with the solid, loading door. The purpose of this door will be explained later.

These doors are firmly secured but can be easily removed if they are held by ordinary strap hinges that have a removable metal hinge pin. The opposite side of the door may be fitted with ordinary hasps.

Finishing Material

Oil enamels, formulated especially for tumbling, are sometimes used. These enamels usually require heat for drying and have little to recommend them over tumble lacquers or synthetic resin enamels. They also offer somewhat of a fire hazard.

Tumble lacquers are usually made fairly heavy in body, so they may be reduced to suit a variety of conditions. They are available in almost any color, ranging from cream to very dark colors, such as brown and black. They are also made in natural wood finishes such as cherry, walnut, mahogany, etc. To my knowledge no one has yet made a satisfactory white tumble finish.

Usually, these tumble finishes consist of two essential materials —a tumble base and a tumble polish. The base material is usually dull in luster but has a good bond with the wood and provides a durable finish of the desired color. The polish is then added to impart a high luster. Sometimes chunks of paraffin or carnauba wax are placed in the barrel to impart the luster. With these waxes it is not possible to secure nearly as high a gloss as with a properly formulated tumble polish.

Tumbling Temperature

Tumbling is like any other method of finishing, in that better work is accomplished in a tem-

THIS METALLIC MODERN ISM!

New forms—new materials—new finishes!

Swiftly they are transforming and uniting the furniture business and metalworking. You can't duck modernism. But you can USE it, profitably.

The secret is a finish so perfect that your severe modern surfaces will not have a single flaw in their entire expanse. Manufacturers who want to be sure of their footing in the modern trend are coming to Egyptian for dependable finishes. We can help *you* participate profitably in modernism!

THE EGYPTIAN LACQUER MFG. CO.
90 West St., New York City

Branches in charge of practical men *maintained in*

Atlanta	Boston	Buffalo	Chicago
Cincinnati	Cleveland	Dallas	Detroit
Kansas City	Los Angeles	Philadelphia	Portland, Ore.
San Francisco	Seattle	Spokane	St. Louis

The Maker Who is Proud of What He Makes Uses Egyptian Lacquer

perature of 70° F. or more. The finishing materials should be brought into the finishing room 24 hours before they are to be used. This insures their being at room temperature at the time of application, thus giving greater coverage and better adhesion.

(To be continued)

New Automobile Finishes

One-color treatment stresses the simplicity of body lines and the ensemble of the design, in the new cars at the National Automobile Show at the Grand Central Palace in New York. It also makes possible the use of tints of the distinctive mood and to the best advantage, as there is no interfering secondary tone to detract from the effect of the whole.

With the softly moulded contours of the bodies which accentuate length and suppress height, these offerings have resulted in interesting, novel aesthetic color arrangements. The new models epitomize simplicity of design so successfully that a single all-over color meets every artistic requirement.

In many cases, the single color all over on body, moldings and fenders has especially outstanding effects. Rich regal blues, such as serge, state and classic, are favored for finishing the formal car because of their dignified mood. Where serge blue is employed the stripe is powder blue. Washington medium, princess and limousine blues are to be seen.

The popularity of black, green and brown in the textile field is reflected in the treatment of these colors. Black and green appear to be popular. Greens range from very dark, medium, bright, bronze green to the pastel shades on the order of jade mist. Medium browns appear to be the most popular. Among the browns are chicle drab, thorne, copra drab, nut brown and stone brown.

Maroon, which fell off to a certain extent last year, is among the leading colors. There is treatment of maroon in crown, boulevard, rubicelle deep, maharajah, Burgundy and baronial.

Among the grays are cannon smoke, black maple, battleship, aristo, and pastel gray. Bright, dynamic colors, such as canary or Africana, red similar to magic flame or dragon, beiges, etc., are employed on roadsters and some phaeton types of cars. One of the highlights in body finishes was an entire leather-covered body on one of the more expensive cars.—G. H. Hirst.

J. H. Wood Elected President of Standard Varnish

J. Heath Wood, formerly vice-president of the Standard Varnish Works, at Chicago, has been elected president to succeed J. W. Robson. He will make his headquarters in New York. A former general sales manager of the Standard Varnish Co., later merged with the Standard Varnish Works, Mr. Wood had supervised the sales organization in the middle western territory.

Board of Governors of the Mart Elects New Officers

At the meeting of the Board of Governors of the Mart, January 13 in the Furniture Club of America, Oscar Klamer, president of the Klamer Furn. Corp., Evansville, Ind., was elected chairman of the Board, succeeding the late Geo. M. Petrie. Frank O. Huffman, president of the Drexel Furn. Co., Drexel, N. C., was elected vice chairman, succeeding A. D. Gorrell of Chicago. Wm. H. Wilson, vice president of the American Furniture Mart, was again chosen secretary and treasurer. Four new members of the Board were elected to bring the membership up to its full quota of 24.

WITH THE RIGHT FINISH, YOU'LL FINISH RIGHT

"Check!" and "Double Check!"

The words made famous by Amos and Andy, were applied, seriously and conscientiously, by the Lilly organization long before the days of radio. Before any shipment of Lilly varnish, lacquer or enamel can leave the plant, it must be carefully checked with the approved formula and double-checked with the sample kept on file.

Once a Lilly formula is developed to meet particular requirements, it becomes a definite standard for that job. Quality in the product, individual fitness for its task, manufacturing precision, and absolute dependability in performance means satisfaction—always.

Whatever your finishing problem, a Lilly formula will solve it. Write us about immediate or future requirements.

LILLY VARNISH CO.
666 South California Street
Indianapolis, Indiana

LILLY
VARNISH
LACQUER
ENAMEL

New Materials and Equipment

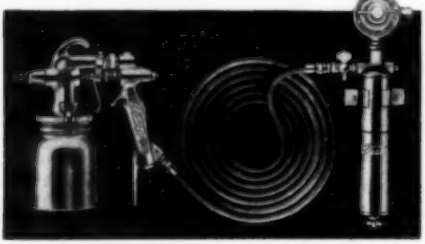
Presenting briefly, certain outstanding features of new or improved materials, supplies and equipment which have been developed and made available for use in modern industrial finishing departments

Spray Painting Outfit

The Metal Specialties Mfg. Co., 338 N. Kedzie Ave., Chicago, Ill., presents a new Presto Model 95-OC spray finishing outfit developed for use in industrial plants and automobile paint shops. . . . designed to give speedy application when attached to air lines or compressors delivering 2-cu.ft. of air or more per minute at 35-lbs. pressure. Any compressor that delivers 4-cu.ft. of air or more per minute will operate two Presto spray guns.

One of the distinctive patented features of the Presto spray gun is the air conditioning unit built into the hollow part of the handle of the gun.

The pressure feed gun produces a steady, uniform spray the instant the trigger is pressed. It is adapted for applying every material—from the lightest stain to the heaviest lacquer, primer, lead paint, varnish, bronze or enamel.



The outfit consists of a spray gun with quart clamp-on container, 25-ft. of rubber hose, two air conditioning units, pressure regulator and gauge.

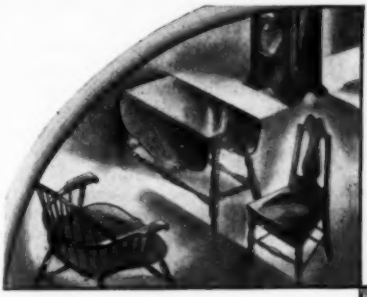
A specially designed needle valve, accurately fitted into the fluid tip, controls the size of spray and amount of material applied.

Paint Can Holder

A new and exclusive piece of equipment, designed to modernize the refinishing shop is being offered to the trade by The Sewall Paint & Varnish Co., Kansas City, Mo. It is called the Dural Automatcher—a convenient stand having a revolving table top around the rim of which are ranged 15 Dural cans from which 1000 colors can be blended.

The Dural Automatcher is a convenience to the refinisher in that it permits him to mix any quantity, large or small, at a moment's notice. The cans of color are hinged and are equipped with pour caps so that without even removing a can from the table, it is possible to pour out the right amount of each color into a graduated measure.

No stirring of the paint is necessary since at night, when the Automatcher is not in use, the cans are turned upside down on their hinges. They are tipped into position during the day, this reversal of their position twice



TEGLAC *makes better* FURNITURE LACQUERS

Lacquer finishes for modern furniture receive much abuse. Whether they stand up under this or not depends largely upon the lacquer ingredients. From the sanding sealer to the final finish, high gloss or flatted as you prefer, Teglac is the logical choice.

When makers formulate with Teglac they note how compatible it is with Nitrocellulose. Lacquer users note how it improves working qualities . . . note its freedom from gum blush . . . its almost marproof hardness . . . and its lustrous depth of finish. These are the appearance values that sell Teglac-finished furniture.

Teglac can be used in either clear or pigmented lacquer. Wherever demand calls for better finishes for furniture there is need for Teglac. Let us send you or your lacquer maker the full technical data. At the same time, if you are interested, we will send information on our other lacquer products: Rezyls, for outside endurance; Balsams for plasticizing; and Ethyl Lactate, a high-boiling solvent.

Industrial Chemicals Division

American Cyanamid Company

535 Fifth Avenue New York

Sole distributors for Nitrocellulose manufactured by our subsidiary, the American Powder Company

daily keeping the material thoroughly agitated and assuring perfect matching.

With the new Dural Automatcher, which is being distributed

"Saves the refinishing shop time and money because there is no waste in spilling and stirring."

free to Dural customers, the manufacturer (Sewall Paint & Varnish Co.) also supplies measuring graduates and color formula books which show all the colors used on popular makes of automobiles and gives the formula for producing the colors.

All lacquer used in the shop may be kept on the Automatcher, which serves as a supply cabinet. The Automatcher top is made of non-tarnishing bright metal which can be cleaned easily.

Andrews Spray Gun

The Andrews & Co., Perry Payne Bldg., Cleveland, Ohio, announces a new universal spray gun simple in design and construction, which is characterized by the following features:

1—The nozzle is adjustable to all varying air conditions.

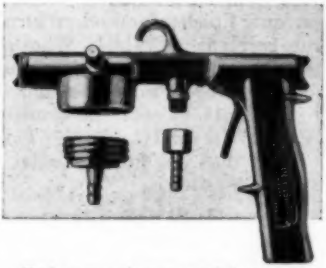
2—Either high or low pressures; 30 to 100-lbs. air pressure.

3—Perfect control of both air and liquid.

4—Breaks up the lacquer or other liquid into a fine smooth mist, insuring perfect distribution of the color or finish.

5—Light and well balanced, weighing only 1-lb. 2-oz. with attached container empty.

6—Trigger is conveniently placed and easily operated to provide instant and positive control of spray. The liquid is drawn from the bottom of the container, main-



Notice convenient cap and hose connection for use in place of cup container when desirable.

taining the desired fluidity of the liquid, and insuring against loss of color due to settling out.

Synthetic Resin

The Glyco Products Co. Inc., Bush Terminal Bldg. No. 5, Brooklyn N. Y., has recently introduced a synthetic resin which is of interest because it is completely water soluble. This resin is a glycol condensation product which is marketed under the name of Glycopon Xc.

Glycopon Xc is a sticky resin, light amber in color, odorless, tasteless and insoluble in organic solvents. It is non-drying and non-hygrospic. When used with water soluble gums, glues, gelatines,

It is extravagant not to use

BUTANOL!

No other single lacquer solvent has so many useful properties.

No solvent has such remarkable ability to blend other useful lacquer materials which, without Butanol, could not be used together

Butanol holds down overhead charges by reducing to a minimum the number of raw materials necessary for the manufacture of any type of lacquer.

Butanol brings down labor charges by simplifying lacquer-making operations.

Butanol is essential to success in lacquer manufacture.

COMMERCIAL SOLVENTS CORPORATION

Plants
Terre Haute, Indiana and Peoria, Illinois
Sales Offices
230 Park Avenue, New York, N. Y. | Terre Haute, Indiana | Aldwych House, London, W. C. 2, England

casein, it promotes greater adhesion, prevents brittleness and acts as a flexibilizer or plasticizer. Because of its insolubility in oils, alcohols, hydrocarbons, and other organic liquids, it may be used as a seal in joints, valves, etc. It has good fire-retardent properties and for this reason is creating an interest for fireproofing textiles, wood, leather, paper, etc. It is non-corrosive and does not decompose (integrally) at elevated temperatures. On heating it becomes harder until finally a glass-like solid is formed. This is of interest in cementing sheets of glass and other materials. Technically it often replaces glycerin where a heavy aqueous medium is desired for suspending solids.

It is non-corrosive, non-toxic and non-drying. Its effect on the skin is very soothing and it prevents "chapping" in cold weather. Its antiseptic properties are far superior to glycerin. In textiles it prevents "mildew." It may be used as base for toilet preparations and as a non-staining base for ointments and salves.

White Enamel Lacquer Stands Baking

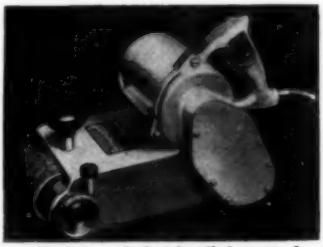
The Bloomfield Chemical Co., (lacquers, thinners, solvents), Newark, N. J., announces that a recent product of its laboratory is a clear transparent lacquer and a white enamel lacquer that will stand baking at 135° F., four hours without becoming brittle or discoloring.

One manufacturer for whom these materials were formulated found it necessary to bake his product at 135° F. for four hours after the wooden parts had been finished and installed in the equipment, to be baked. As these wooden parts were exposed and showed, it was necessary to use a lacquer which would retain its original color and plasticity. It is said that the four hours baking at 135° F. is equivalent to approximately one year's drying time at normal temperature.

Portable Belt Sander

Skilsaw, Inc., 3324 Elston Ave., Chicago, announces a new and improved electric belt sander for use in cleaning and smoothing surfaces to be finished.

One of the important mechanical features of this new sander is the adjustment of the front roller on an eccentric shaft, with spring tension, which permits changing belts in 10 seconds. Tension is controlled by a hand wheel on the side of the machine.



"Perfect surfacing in all degrees of cutting without ripples."

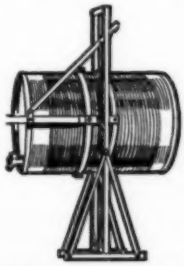
A convenient thumb screw adjustment provides perfect alignment of belt on the rollers at all times.

The frame is made of aluminum and is die-cast. The motor, air-cooled by centrifugal fan, is a universal type operating from any light socket on A. C. or D. C. The helical gears are especially designed for silent operation and are made of heat-treated nickel

steel. The belt size is 4½ x 26¼ inches with a free speed of 1700-ft. per minute. Pulleys are 2½-in. in diameter. The over-all size of the sander is 7 x 14 x 9-in.; net weight is 18-lbs.

Mounted Drums Easily Handled; Drained; Filled

The Perfection Drum Hanger Co., 602 Finance Bldg., Kansas City, Mo., is now offering an all-metal rack or hanger in which a drum of finishing material or cleaning material can be easily



Height, 55-in.; width 27-in.; all parts stamped and cut from cold steel.

mounted so the user of such materials can readily mount the drum in this steel frame so it can be tilted or placed in either horizontal or vertical position for draining or refilling. The task of placing a filled drum in the hanger and handling it thereafter is easily performed by one man.

According to the manufacturer: "The Perfection drum hanger keeps the drum upright when not in use, thus stopping any faucet dripping, and preventing loss from such source." Further it "saves waste of liquid products, time, money, work; prevents muss and dirt; banishes back-breaking lifting of drums; also eliminates fire menace. Comes knocked down, but is set up easily in a few minutes."

Asbestos Filtering Compound

The Alsop Engineering Corp., 39 W. 60th St., New York City, presents to the trade a newly developed product, a full-floating asbestos, which has been compounded by an entirely different process in a new type machine designed by Alsop engineers. According to the company, this compound has been developed "after five years of constant experimenting with asbestos filtering compounds for use in over 1,000 gravity asbestos filters, manufactured by us."

Electric Paint Sprayer

The Breur Electric Mfg. Co., 848 Blackhawk St., Chicago, has placed on the market an electric paint spray machine of a new design for touch-up work, shading, light finishing, refinishing, and maintenance work. This new machine is known as the "Tornado" portable electric paint sprayer, and is of the rotary compressor type, built of aluminum and equipped with a G.E. Universal motor.

Airplane Finishing Specifications

The Sherwin-Williams Co., 601 Canal Rd., N. W., Cleveland, Ohio, has ready for distribution an interesting and informative booklet entitled "Airplane Finishing". This booklet has 15 pages 8½x11-in. in size, an attractive 3-color cover, and contains a treatise on airplane finishing, giving in detail complete airplane finishing specifications.

In addition to the finishing specifications, this booklet devotes the entire last page to color samples (giving the correct name for each color) of the standard colors adopted by airplane manufacturers; also, it shows various colors obtained through tinting.

Finishing an Asphaltum Test Panel

On an asphaltum composition test panel I had to finish recently, it seemed that almost any material used in finishing caused the asphaltum to soften and bleed through. Various makes of lacquer sealers, and shellac were used without success. Then I tried spraying a coat of aluminum bronze, ground medium fine in shellac. A light dust coat of this was applied rather dry, for only a small amount of shellac is necessary to soften the surface and permit the aluminum to unite with it. This coat was allowed to dry four or five hours, then it was sanded, and a second slightly heavier spray coat was applied.

This was found to be a satisfactory sealer, and it permitted other finishing coats to be applied without discoloration or bleeding. —M. V. L.

Refinishing Aluminum Car Bodies

An alkali paint remover should never be used to remove the old lacquer from aluminum automobile bodies. If this material is used—even though the surface is thoroughly gas sanded, cleaned, primed and lacquered—the lacquer will peel off. This is due to the corrosive action of alkali on aluminum. If an alkali paint remover should by any chance be used in removing the old lacquer finish, and if the job is returned to be again refinished, the defective lacquer coat may be removed with an alcohol paint remover.

Before applying any finishing materials, the aluminum surface should be washed thoroughly with vinegar or a weak solution of acetic acid, allowed to stand a short time, and then washed with clear water, and dried. Then finish coats may be applied with assured good results—all else being equal. —P. C. B.

Today no business rests solely on the physical assets of lands, buildings and equipment, except as the worthy tools of earning power under able management.

Day's New Representative

W. E. Dennis, formerly with Faust Paint Co., St. Louis, has joined the sales force of James B. Day & Co., Chicago, with headquarters at Indianapolis, Ind.

Dolan Increases Sales Staff

V. J. Dolan & Co., 1330 N. Laramie Ave., Chicago, Ill., announces that they have added Mr. I. Morton to their Chicago sales staff; he will also handle Wisconsin territory.

SAN-ITAI-RIE FILLER

Pat. No. 1658605

For All Defects in Wood

Manufacturers in all wood-using industries find SAN-ITAI-RIE FILLER unsurpassed in filling cracks, worm holes, knot holes, open joints, dents, pitch pockets, etc., and through its use are able to send out their products without a flaw.

Put up in friction top cans—half pints to gallons—in 20 different colors. Send for sample can.

SAN-ITAI-RIE FILLER CO.

Division of

164-170 W. Kinzie St. G. J. Liebich Co. Chicago, Ill.

Metal Finishing Department
Cleaning-Handling Baking & Polishing

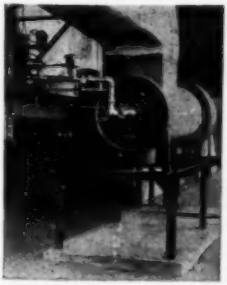
What equipment
Hupp Motor Car Company
Uses for—

Dipping and Baking 3 Coats Continuously

A continuous chain-and-crossbar conveyor carries the parts to be japanned through three dipping and baking units successively, each unit consisting of a dip tank and A-type oven arranged as shown in Fig. 1 on next page

*By J. B. NEALEY**

A MOST INTERESTING installation for japanning, in which is incorporated several unique features, has recently been made in the plant of the Hupp Motor Car Corp., Detroit, Mich. The equipment includes three bake ovens and three dip tanks, the former being housed in a building erected on the roof of the main factory and the latter on the top floor. The setup is continuous and automatic in operation, three coats being applied and baked in three ovens with the use of but one conveyor.



The separate units are placed in a single straight line so that the one traveling conveyor serves them all without any change in direction in the horizontal plane. In the vertical plane, however, this conveyor travels up through the roof to the gas ovens, returns below to the dip tanks and repeats until the cycle is completed.

Along the line of travel of this conveyor and directly beneath the ovens, this sec-

*With American Gas Association.

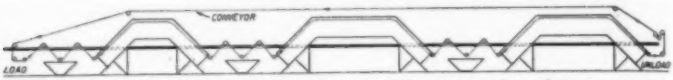


Fig. 1—Side elevation diagram showing dip tanks, bake ovens and continuous conveyor

tion of the top floor is divided into eight sealed rooms, the partitions being of the same construction as the building proper—brick and concrete. The first and last rooms are used respectively for loading and unloading the conveyor, while the second, fourth and fifth contain the dip tanks. Clean filtered air is blown into these rooms and just enough air pressure is maintained within them to prevent the infiltration of outside air containing dust, dirt, etc. This protects the quality of the finishing coats.

The blowers and air-conditioning equipment are located in rooms No. 2 and No. 6. Batteries of carbon dioxide tanks for fire prevention are placed in room No. 5. Piping connects these tanks with the various sections of the installation. Fusible links are placed at key points throughout the system and should the temperature in any section rise above a predetermined degree, the flow of carbon dioxide would be released and immediately flow to the affected section.

The conveyor (made up of two parallel chains between which rods are suspended) is operated by a motor located close to the unloading end. By controlling the speed of the conveyor, through a speed-reduction gear train, the baking periods are regulated within any time limits specified. The parts are hung onto the conveyor and never leave it until it is unloaded. During its travel it receives three coats—priming, rubber and finish—each coat being baked separately in a different oven, and at approximately 450° F.

Fig. 2—View of the three ovens in perspective, each oven being supplied with heated air from gas-fired heaters.

The heating of the ovens is accomplished indirectly—each oven being supplied with a separate air heater (two in the case of the last oven). The ovens are of the A-type and constructed of sheet steel. The heaters each consist of a single sheet-steel shell, into one end of which fires a single gas burner that is provided with a gas air-proportioning device so that the atmosphere of the ovens can be regulated. On the opposite end of the heater is a motor-driven fan that blows the heated air into the oven.

In order to obtain fuel

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The Condensveyor system combines the benefits of cross bar operation in the oven and monorail operation outside the oven along with conveyorized and automatic vertical drop sections. Vertical dipping permits the use of the minimum possible size of paint tank thereby always assuring freshness of paint and uniformity of color. The small sized tank has the added features of decrease in waste and elimination of fire hazard in addition to which it may easily be mounted on wheels so that change in color may be made instantaneously.

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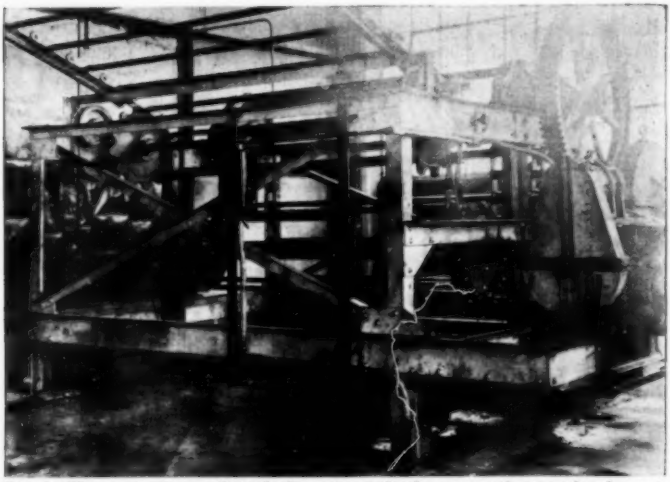

Fig. 3—The conveyor, sprocket wheels, motor, reduction gear and supporting frame at one end of the conveyor line.

economy, about 90% of the waste heat of the oven is blown back to the heater, mixed with a certain amount of the fresh air and recirculated in the oven. This is taken off at the point of greatest volatilization, just above the exhaust duct; the rest of the waste heat in the oven is vented to the outside of the building through an exhaust duct located in the first leg and just below the roof line. The hot air for baking is forced in at a point on the second leg, so the heat flows counterwise to the movement of work. This principle affects another economy in fuel, as the cold work is preheated by the waste heat as it is exhausted.

These ovens are equipped with temperature controls which work automatically through motor-operated valves in the gas supply lines. When the temperature rises to above a predetermined setting, the valve closes, but enough gas passes through a by-pass to keep the pilots going. When the temperature drops, the valve reopens. All pilots are supplied with spark plugs operating intermittently.

Accident prevention devices include solenoid valves in the gas supply lines to the heaters which automatically close and shut off the gas flow if, for any reason, the blower fan motor should fail, or if the temperature of the oven should suddenly rise above the upper limit of the control setting. All of the motors are operated through a central control switch which is interconnected with the fire extinguishing apparatus. This switch is automatically pulled when the flow of carbon dioxide starts.

These ovens and tanks occupy a space about 400-ft. in length, the first oven being 52-ft. long and the other two 87-ft. (each) in length. The approximate width

COLOR
BRIGHTENS THE DRAB, QUICKENS THE SALE!

In the past few years the automobile has acquired the plumage of tropical birds; has opened the eyes of millions to the romance of color, has offered relief from the dull. Makers of many products awoke to find their markets dormant . . . their trade did not want any more broomsticks unless they were green ones, or reds, blues, yellows!

Let us tell you of a typical case:

For a long time the plant of a certain metal strip manufacturer (*name on request*) ran along smoothly producing thousands of feet of tinned or coppered steel strip for fastening together cardboard boxes. Suddenly came the demand for fancier, dressier boxes.

Although the ultimate consumers would have no more old-fashioned box-edgings, they made it clear that they would pay no more for the color-finished ones!

This stiff problem resolved itself into the following:

(1) Colored coating of both transparent and opaque types must be developed and furnished for coating continuously, cold-rolled steel strips in one continuous operation, converting the raw metal to the *finished* product at the mill. No room here for use of primers!

(2) The lacquered steel strips had to be supplied to the metal-edge manufacturer in continuous reels to be fed through the blanking and punching dies.

(3) Any more than .0005 in thickness of the lacquer would require a greater clearance in the dies, would add to the hazard of their blocking or injury.

(4) The lacquer finish must stand blanking and punching operations *without* a loss of adhesion, without flaking at the cut edges.

(5) The time required by the wire mill to deliver the finished strip, in reels, to the manufacturer was often long. The finished strip, obviously, had to remain flexible, could not brittle or it would be useless.

(6) The finish had to be oil-proof so that dies could be properly lubricated and yet not soften the lacquer.

(7) The metal-edge manufacturer set an arbitrary period of a year during which his colored steel strip, which by this time had been re-reeled and sent to shipping rooms the country over, had to remain adherent and at the same time sufficiently flexible to stand the final operation of actually clipping and bending the strip to form the cardboard boxes.

(8) Incidentally, it was necessary for us to assist in the designing of suitable coating and drying equipment to speed production.

(9) The photograph will help you recall the many occasions on which you have seen one of our products demonstrating its qualities, not knowing it was *ours*.

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of each of them is 12-ft., while the distance from the top to bottom is about 9¾-ft. The distance between the floor on which the tanks set and the bottom of the upper sections of the ovens, is about 20-ft. The dip tanks are of steel and are shaped like an inverted A, the tops being 19½-ft. and the bottoms 3½-ft. long; they are 8-ft. deep.

The conveyor is looped and takes the work through the tanks and ovens, returning over the tops of the ovens to the loading end, as shown in Fig. 1. Here it rides down over two sprockets, one directly below the other and 9-ft. apart, and makes a right angle turn over the bottom one, to a third, directly in line, horizontally, and about 5½-ft. distant. This horizontal exposure of the conveyor is used for loading, the operator standing beneath and hanging the work onto the conveyor rods as they pass.

From this third sprocket it requires three more to raise the conveyor and work over the end of the first tank, dip down into and raise it out again. The line of travel from a high sprocket to a low and vice versa is always at an angle of 45°. As the conveyor rises out of the tank over the sixth sprocket it descends to another at the mouth of the first oven, then up the first leg, across the top section and down the other leg. As the work emerges the first coat has been thoroughly baked on and the parts then pass into the second tank for the second coat, and so on until the third and last coat has been applied and baked, when the finished parts are unloaded.

Each and every employe works on his honor in regard to the quality of his workmanship.

Removing Baked and Lacquer Finishes

In a small custom plant that had not installed a hot caustic soda bath for cleaning off baked enamel finishes, it was found that nitric acid mixed with a benzole paint remover proved very effective. After removing the old finish, rust spots were washed with alcohol, and the entire surface was gas sanded, using No. 220 dry sandpaper and gasoline—not ethyl gas. After a thorough cleaning, the surface is prepared for refinishing.

It is said that if this process is applied to old lacquer finishes on automobile bodies and followed up with an alcohol paint remover, all of the old lacquer can be washed off with a gentle flow of water. —M. V. Leach.

Colors Popular for Automobiles

According to the January issue of "Automobile Color Index", published monthly by the Duco Color Advisory Service, evidence of a distinct seasonal trend in automobile color appeal is apparent. Black continues to maintain leadership but on a declining trend, while green has established a remarkable upturn since last October and is now second in importance to black.

Blue appears to decline in importance in November and December. Last year blue did not commence to advance until the middle of March. The acceptance of State blue has nearly doubled during the past month. Some interest is apparent in bright greenish blues, but deep grayish Lombard blue is still the undisputed blue leader.

The rate of brown's decline has decreased considerably since the abrupt drop recorded for this hue last month. It is probable that brown's decline has terminated for the present. Soft rich values of beige and dark bright Thorne brown continue in strong favor.

Maroon keeps on climbing at a good rate.

Gray has had a substantial advance this month due to the successful sales appeal of a number of newly tried shades such as Cairo, Gloucester and Gargoyle.

Dip Finishing and Drying Rack

In a Denver machine shop, doing job work, many of the small metal parts turned out must be painted or coated after they are completed. The rack shown here was devised for quickly and economically drying these painted articles.

It consists of a 3 x 6-ft. frame made of light angle irons, and suspended from the ceiling. A number of ½-in. rods fit crosswise in this frame. Each small article to be finished is placed on a small wire, which has a hook on each end; a number of these "loaded" wires are strung on one of the rods, then dipped in the vat of finishing material, withdrawn, and placed in the rack. In this way the tiniest metal parts are easily handled and may be placed so as not to touch each other. A sloping drip pan beneath the rack catches the surplus finishing material and drains it back into the vat.—J. C. Coyle.

Small Sprayer Useful

It makes little difference how big or how important we are—we can generally use a few small tools to advantage. This is just as true in finishing as elsewhere. For instance, here comes a little special job with a type of finish all its own. How we hate to mess up large or elaborate equipment with such a dinky little job. And here is where the small electric paint sprayer comes in handy, for if we have one of these at hand we do not need to use our regular outfit on such jobs. Surprising as it may seem, some of these little units, equipped with the rotary type of compressor, will develop a pressure of 30-lbs. or more.—H. R. L.

Suitable Spraying Air

We all know that there are air compressors galore, and that there is considerable difference in air compressors of different kinds. Some are designed mostly for this and others mostly for that—although to some extent the precipitating compressor may be considered good all around. It is a notable fact, however, that some concerns have designed compressors for the specific purpose of furnishing air for spraying paint, and such could hardly fail to render first-class service along this line.—C. M. J.

Finishing Sewing Machines in Black Baked Enamels

By E. PERRY

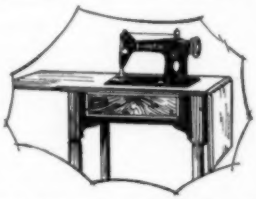
Cleaning, filling, dip finishing, baking on the black finish and decorating the castings for ordinary "black-casting" sewing machines—wherein the long-time bake at comparatively low heat is a feature of the process

THE MANUFACTURER of sewing machines constitutes one line of production which largely continues its original character of finishing—that of using black baking enamels of the asphaltum type.

Recent models of the finer class of household machines, of course, are entirely different, in that the castings are embellished with intricate patterns reflecting high-class foundry work and, when finished with the new crystal-finish lacquers, the result is a very beautiful ensemble. The present write-up, however, is intended for bake finishing; therefore I shall confine my subject to the old-style domestic machines and those made for industrial establishments, tailor shops, and similar uses.

Castings from Foundry

The castings, as they come from the iron foundry, must be smoothed down, and any holes or particularly rough places must be puttied and surfaced. Large blow holes require filling with an iron cement like "Smooth-On"; otherwise the ordinary depressions, as from sand holes, are sufficiently obliterated when the entire casting is dressed up with several spray coats of filler surfacer.



In lieu of this filler coat, which should be sanded down before enameling, it is also customary practice to dip the sewing machine head into a special heavy-bodied black japan reduced about one-third with mineral thinner. This first coat is baked during 10 hours from the time the oven reaches 200° F. The full bake practically constitutes an overnight baking, reaching a maximum heat of 290° to 300° F. Next day the head is again dipped into the same finishing japan and baked nine hours after the heat reaches 200° F., and running up to the same maximum temperature of 290° to 300° F.

Usually the casting receives a third dip coat in the same material, and is baked only eight hours after the heat reaches 200° F., and running up to the same maximum temperature as before.

Decalcomania Decoration

After this the head is carefully water-rubbed with pumice and felt. By this time the casting should present a completely filled and fully rounded out appearance. Now the decalcomania

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transfer is applied, and following that the head in given a finishing coat of high-gloss clear baking varnish. The varnish is baked 11 hours (or overnight), the maximum heat reaching 150° to 160° F.

The head is then sent to the machine shop to be fitted and to receive the accessories. Here it becomes covered with oil and grease by mechanics handling it, but afterward it is washed off and polished ready for shipment. This varnish must be very pale in color, and must not discolor in baking, because any yellowing or browning over the black enamel would cause a greenish appearance in the finish. Also, the varnish must not soften nor lose luster from contact with the oil and grease, nor from the washing off with naphtha.

Some manufacturers use the spray system throughout, using pigment first-coat and normal-body finishing enamel, consequently getting away from the long-time low-temperature bake. The older method, as above described, however, gives a fuller and more rounded coating, but obviously the heavy-body japan cannot be forced in the baking—or wrinkling would ensue—so the long-time bake at low heat is necessary to thoroughly bake and harden the coatings throughout.

Cleaning and Finishing

Automobile Pressed Steel Instrument Boards

By GEO. MOSKOS

Experienced metal finisher tells how to clean and prepare the surfaces of automobile instrument boards and window mouldings to be finished in imitation of fine wood graining

THE "WASHING METHOD" we use for cleaning pressed steel window mouldings and dashboards for automobiles before finishing requires a series of tanks containing hot washing solutions with the proper amount of cleaning compounds to insure absolute removal of all grease, oil and dirt. The metal parts to be cleaned are placed in a wire basket suspended from an overhead trolley. These baskets are lowered into a cleaning tank, where they remain for 3½ minutes. Then they are withdrawn and submerged in a second tank, which contains clean cold water for rinsing. The last tank in which the parts are dipped contains clean hot water to speed drying after rinsing.

Extensive tests and experience proved that moderate sandblasting —at about 30 to 40-lbs. air pressure —will insure excellent adhesion of finishing materials to metal

R1743 TOPCOAT LACQUER

R1743 is an extremely high solid, nearly water white, topcoat lacquer. It gives a high natural gloss but may be buffed, particularly when used over a bronze powder finish to give even higher gloss. ●● The combination of extremely light color, buffability and high solids is unique ●● The building is that of a wood lacquer, while the color resembles the silver lacquer type ●● R1743 is sold at spraying viscosity. We invite your inquiries and orders.

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surfaces. After sandblasting, the articles are ready for the priming coat.

When the parts are clean and ready to receive the priming coat, we spray a coat of deep brown iron-oxide primer on both sides of each piece and place them in the racks mounted on the steel trucks. We bake the prime coat for 1½ hours at 275° F.; then sand the surfaces with No. 6/0 sandpaper and placed the parts back on the trucks. They are now ready to receive the next coat of finish.

Window mouldings and dashboards may be finished in light brown or black, or they may be grained by hand or by the copperplate method.

Walnut Grain Effect

To produce an attractive walnut grain effect on these metal parts, it is important to select a lacquer ground coat of the proper consistency. Almost any colored grain effect can be obtained by using the correct combination of ground color and graining compound. Special graining tools are used to apply graining to imitate walnut, mahogany and rosewood for special jobs.

Before applying stain, we sand each piece with No. 150 sandpaper and dust the surface with a cotton rag. We use a 2-in. ox hair brush, or a medium size sponge to apply the stains on window mouldings and dashboards. Our hand grainers use a graining paste thinned with turpentine to apply the graining effects on each piece. Before blending, the grainer uses a fan grainer (stipple brush) or a check roller to imitate the pores in walnut wood; then he uses a 3½-in. blender to soften the graining on the surface. By using this hand graining method an expert grainer is capable of producing very artistic effects resembling real wood on metal.

To produce such graining effects as burl walnut or curly maple on dashboards, we generally employ the copperplate graining method. Special rubber rollers can be used to imprint the grain on window mouldings.

To Imitate Rosewood

To imitate rosewood we use a very light red mahogany ground color, and grain it with a specially shaped sponge and a few other tools—such as a mottler and a few artist's camel hair brushes. The color of rosewood varies from a light orange to a jet black. A precaution that one must always keep in mind when applying a rosewood grain effect on metal, is to never load the sponge or tool with too much graining color. Otherwise, when it is blended, the job will show a muddy appearance.

Mahogany Grain Effect

A few tools and a blender are all the equipment necessary to produce an imitation mahogany grain finish on metal. The copperplate method of grain reproduction is employed for faster production in this work. However, very little mahogany finish is used on dashboards and window mouldings, and what is used is generally a brown mahogany.

After these parts are grained, they are placed in the racks on steel trucks and baked for 2½ hours at 275° F. After being baked, the pieces are sprayed with clear lacquer, placed on other racks on steel trucks and baked for 45 minutes at 110° F. Then they are sanded with No. 150 sandpaper and dusted with a piece of muslin. The second coat of clear

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By absolutely novel formulation, we can now present a line of dipping lacquer enamels of most unusual qualities.

Irregular shapes and long and complicated pieces are covered solidly, without bead or sag: in one coat for most colors. Wire objects are perfectly finished in incredibly economical fashion.

For many industries, this will be as important a development as the spray gun, which it will replace for a diversity of purposes.

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gloss lacquer is applied and the parts are again placed in the racks on the trucks and let dry for 45 minutes.

Rubbing; Striping

For rubbing, we use the finest grade pumice stone mixed with water or oil. A quicker but less beautiful rubbed finish can be obtained by using No. 120 "water-rub" sandpaper moistened with crude oil mixed with rottenstone. The most important part of this work is to watch the edges to avoid cutting through.

Striping is done either free hand or with a striping pencil, the latter being when it is important to speed up the striping operation. For striping we use lacquer and japan colors. Most of the striping is done with pale gold mixed with high grade varnish and very little high-grade turpentine.

Plain finishes such as brown, black, and blue are all done in air-drying lacquer enamel in from two to three coats. The coats are sprayed 50 minutes apart and the surfaces are sanded with No. 120 sandpaper between coats. The plain finishes usually take the same rubbing and striping as the grained finishes do.

Finishing Electric Signs

Both the spray gun and hand brush are used in finishing metal signs at the plant of the Q. R. S. Neon Corporation Ltd., Denver, Colo., although hand brush work predominates. In the application of various colors in stripes and background it has been found quicker, and therefore cheaper, to cut in with a hand brush than to spend the time necessary to mask off the lettering, etc.

All irregularities in the metal

surfaces are corrected in the sheet metal department, before the signs reach the finisher. The surface is then washed with a cleaning solution and given a shot of white primer. After drying 45 to 50 minutes it is shot again with the letter color in lacquer. Two shots of this are given, each followed, of course, with the required drying time. Flat japan colors in enamel are then cut in with the hand brush on the background and borders and let dry one hour. The entire surface of the sign is then given a shot of thinned clear varnish.

Channel lettering is washed and primed as previously described and then given three brushed coats of white, two of red, or one of black, as the case may be. Each coat is allowed to dry 3½ to 4 hours. Individual raised letters are washed and primed as described, then shot twice with 4-hour enamel, properly thinned to suitable consistency.

This 4-hour enamel is also used for refinishing with the spray gun. If the surface to be refinished is in bad condition, it is cleaned with paint remover and finished as a new job; otherwise it is merely sanded down and primer applied.

The glass tubes are bent in the glass-blowing department to form the proper design. Then at a finishing bench, they are blocked off in colors to correspond with the background of each section. A special glass primer is first applied, drying over night. One coat of color is brushed on and allowed to dry over night. Electrical connections for testing out the tubes are provided at this bench. Tubes and the various connections are then applied to the sign, and a final test is made with the current turned on.—J. C. Coyle.

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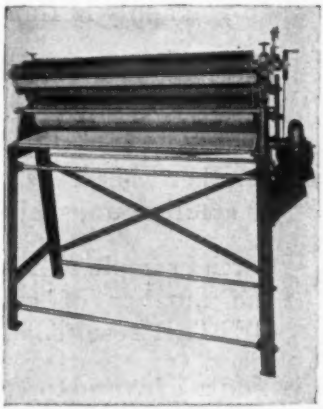

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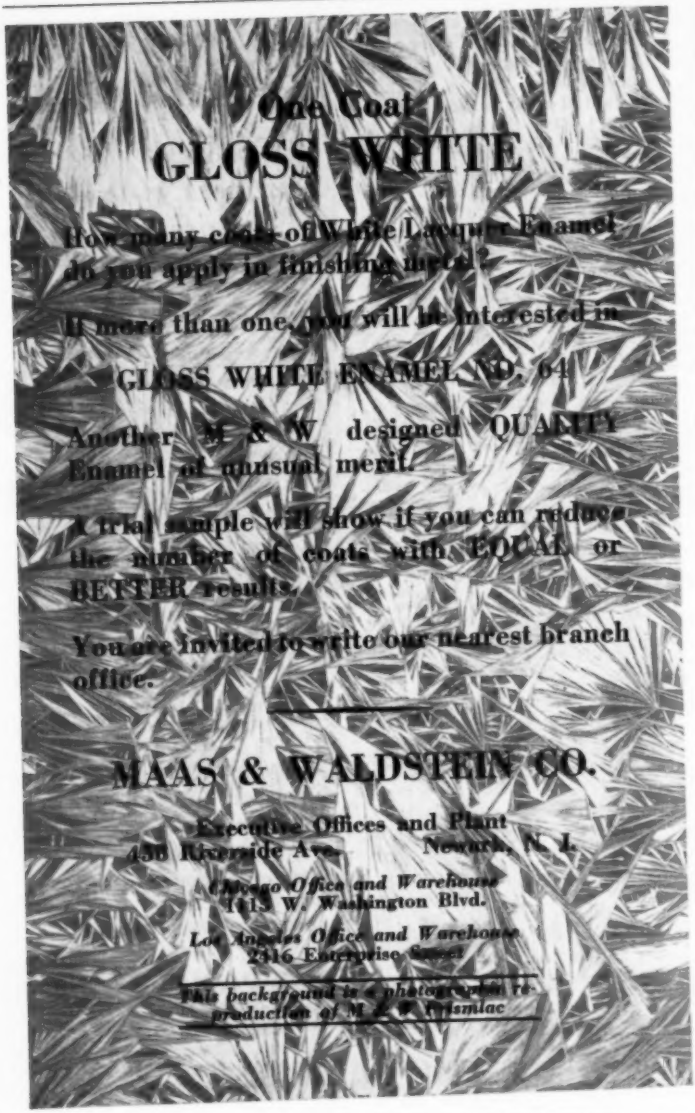
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Questions and Answers

This service department is conducted to meet the reader's need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer any further comments or recommendations pertinent to subjects mentioned

Lacquer Bleaches Putty

How can putty be stopped from turning white when used on a dark finish and sprayed with lacquer before it has hardened? I have tried wood paste, Savogran, and plastic wood, without desired results. If you could suggest something suitable, I would appreciate it very much.—A. P.

I assume the putty is thoroughly colored to match the color of the surface on which it is used or, perhaps made slightly darker. It is the powerful solvents used in lacquer that bleaches the color from the putty, wood paste or plastic wood. To prevent this the puttied surface should be sprayed first with a coat of lacquer sealer which contains a high percentage of zinc sterate, (name of manufacturer on request). After this has dried the lacquer may be applied and it will not bleach the color from the putty. Of course, this sealer could be used as effectively over wood paste or plastic wood.—P. C. B.

How to Finish Willow

I am interested in seeing an article in INDUSTRIAL FINISHING about finishing the surface of willow wood. I have come over some rough roads with this wood, and we still finish a cheap dresser in natural walnut finish, the wood being willow. First, we fill the surface with a 4-hour filler and then, when the filler is dry, we apply strong water stain—about 3½ black and 1½ red. This operation stains one's hands, but the stain can be removed very easily with a combination of potash and sulphite. Next the surface is given a coat of sealer and then a coat of quick-drying varnish; then rubbed in three days.—F. Wilder.

Unless there is some strong or unusual reason for it, willow is seldom used for anything but a very cheap product. While the grain is similar to walnut and can be stained to represent walnut, it is too soft in texture to stand up well under ordinary wear and tear. Also, it is a poorly grained or textured wood. It may best be described in this respect as being "fuzzy".

Evidently, Mr. Wilder is filling before he stains the wood to prevent the grain from raising. This is bad practice and will in nearly all cases impart a "blotchy appearance" to the finish. My suggestion would be to use a water-oil stain. If this does not do the work satisfactorily, I suggest sponging the wood surface with water to which a small quantity of glue has been added—about a pint to the gallon of water—and then in about

five or six hours sand the surface. Then apply the stain, and the grain will not raise. The glue sizing will have a tendency to improve the fuzzy surface so it can be sanded smoothly and finished satisfactorily.—P. C. B.

Making Walnut Stain

I am making a non-grain raising stain, or I might say trying to make it, and sometimes it works fine and then the next batch raises the grain of the wood regardless of what I do. I am using walnut crystals, but have been told it cannot be done with walnut crystals. Will someone enlighten me on this?—F. W.

If you will add denatured alcohol to your walnut water stain in the proportion of 1 to 5, it will aid in preventing the grain raising. The fact that your stain "works fine" sometimes, while at other times you cannot prevent the grain from raising would imply there are other factors that affect the operation. It is my understanding that walnut crystals and the powdered walnut stain material are identical in their properties, the main difference being the form in which they are sold.

The purchase and use of some of the effective water-oil or non-grain raising stains now on the market will solve your difficulties and in the final analysis this will be more economical than your present uncertain methods which give such uncertain results.—P.

Gun Metal Finish With Lacquer

Can you tell me of a method to make an imitation gun metal (blue) finish on plated metal, using any of the following materials: lacquer, varnish or paint? What about the durability of each of the above materials when applied directly on polished metal?—D. S. & L. Co.

To obtain a gun metal (blue) finish with lacquer for application on plated metal, I suggest the following method:

Add one to three teaspoonfuls of silver lining bronze powder to one quart of bluish black lacquer enamel (manufacturer's name on request) and spray on the surface in the regular way. Sometimes one-quarter teaspoonful of dull red added with the silver lining bronze powder will improve the color of the finish. However, a little experimenting with the above mixture will give you the proper tone or shade.

This, of course, is a spray finish and will last as long as any lacquer enamel finish.

The finish can be applied directly on polished metal, but the metal need not be polished to get good results.—August L. Medel.

What Spatter Mixing Is

On page 26 of September 1930 issue of INDUSTRIAL FINISHING there appears an article entitled, "Novel Spatter Finishes," in which the author mentions "spatter mixing". Just what is meant by "spatter mixing"? Is it a prepared enamel sold by a firm or firms, or is it something that you can make up yourself?—J. J.

We are pleased with this opportunity to advise you in more detail regarding a spatter mixing which is used to produce such finishes. Perhaps it will give you a

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better idea of a spatter finish, or what we might also term a stipple finish, by furnishing you with a small panel which shows the actual effect; therefore, we are sending such a panel for your consideration.

This panel was finished with one solid covering coat of aluminum lacquer, made by using about 10-oz. of aluminum bronze powder to one gallon of bronzing lacquer. Following this, the panel received one application of spatter lacquer black.

Innumerable color combinations can be obtained by having the ground colors and the spatter lacquer of contrasting shades, and such a finish is particularly adaptable for novelties of various descriptions.

The ground coat can be any type of colored lacquer, suitable, of course, for the type of surface over which it is to be applied—that is, metal, wood, fabric, or numerous other materials.

The spatter lacquer is made by adding the proper proportion of suitable spatter mixing to practically any colored pigmented lacquer, such as automobile spraying lacquer or industrial spraying lacquer. The general practice is to use one part of spatter mixing to four parts of pigmented lacquer of any desired shade, and then reduce the proper spraying consistency with lacquer thinner.

When using a certain brand of automobile spraying lacquer or industrial spraying lacquer, approximately equal parts of thinner will be required after the spatter mixing has been added.

Such a mixture, of course, can be used with any ordinary type of spray gun and no specially constructed nozzle is required, for the ability to spot and spatter pro-

perly is in the material and not in the mechanism of the gun. In spraying, the gun should be held about 3-ft. from the work.

Very often a gold or aluminum spatter is desired over a color, and in this case the procedure for making the aluminum or gold spatter lacquer is a little different than for making the colored spatter lacquers.

The metallic powder should be first broken up or "wetted" in a small amount of lacquer thinner. The "wetted" powder is then added to a mixture of spatter mixing and a clear lacquer, such as certain types of metal lacquer or bronzing lacquer. The same proportions of spatter mixing and clear lacquer are employed as with the pigmented lacquer. The entire mixture is then reduced with approximately equal parts of lacquer thinner. For best results, approximately 1-lb. of metallic powder, either gold or silver (aluminum), is used to the gallon of spatter mixing and clear lacquer.

If further refinement of finish is desired, a final coat of clear transparent lacquer can be applied. The panel referred to was not finished in clear lacquer. It shows only the finish as obtained by two operations—that is, one coat of ground color and one coat of spatter lacquer.—Murphy Varnish Co.

To Clean Stained Fabrics

We are interested in learning if there exists a product to clean and remove stains from light or so called sport fabric automobile tops, efficiently and without injury. If you know of any product of this nature, we would appreciate any information you could give us that could help us to locate its

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manufacturer. There is also a certain need felt for a product that will bleach or whiten these fabric tops, and we are, of course, desirous to locate a manufacturer of such a material, if such exists in this country.—E. P.

While searching for information on the above subject, I called on several of the refinishing shops in Louisville, Ky., and learned that all of them send their top work to the Auto Top Cleaning Co., 544 S. Second St., Louisville, Ky., and recommend this company's work highly. Mr. Krauss, of this company, tells me that they developed the various formulas for cleaning Burbank, Rubberized, and in fact any and all kinds of fabric tops. They also manufacture a bleach and dye to match the finish on any car.

At one time they tried selling these products, but due to customers' inability, through lack of knowledge, to apply them properly, they received so many complaints that they took the materials off the market and have confined their activities to cleaning and bleaching for the local refinishers. Mr. Krauss tells me that he is willing to sell all of these formulas and furnish a man to instruct the purchaser how to use them.—C. B.

Antique Finished Paper Screens

Referring to the question and answer appearing under the above title in January issue (page 69), I suggest the following:

For some time back, or since scenic wallpaper has come in, there has been a water-white lacquer made especially for wallpaper. After this has been applied you can make your antique from flat varnish with the addition of whatever color you want. Your antique, we will say for instance, is raw sienna and raw umber. You can mist this on with a spray gun or put it on with a brush. After it has "set" a few minutes, wipe off to get the effect you desire; any color may be used. This will need nothing else in the line of coating. You may use white shellac instead of the lacquer for the coating. Sometimes a few spots that are a little thin will take the antique darker and give a very good effect.

Be sure to use the water-white lacquer or shellac, as any colored material will make the light tints of the wallpaper mussy looking, unless great care is used in brushing the lacquer onto the surface; if sprayed, it will make no difference.

If you don't care to use the flat varnish, use a ready-made glazing liquid, which will give a soft velvet finish when done; also this material can be wiped with a damp cloth.—J. K. Cooper.

To Remove Lettering From Aircraft Fabric

Under the above title in January issue (page 65) I notice a question by G.L.H. and two answers, one by Charles E. Kirkbride and the other by G.B.W. Now the methods suggested by these two gentlemen may be all right, although I must confess I would not recommend the use of a putty knife or scraper on fabric. Either of the gentlemen may succeed with the aid of a knife or scraper, but in the hands of the average man I believe that before the job was completed there would be a series of holes punched through the fabric, which would necessitate patching and

this, I believe, G.L.H. wants to avoid.

If the lettering is a straight japan color, why remove it? A good straight japan color will not raise or blister when dope or lacquer is applied over it. However, an oil color will raise and blister when dope or lacquer is applied over it and must be removed.

My experience is that the most efficient and thorough method is to use benzol. Saturate some waste or rags with benzol, apply to lettering, keep lettering wet, agitate the benzol with a wad of steel wool.

Objection may be made to benzol due to toxic poisoning; however, this can be overcome if the operator will wear a respirator and use rubber gloves. Benzol will not attack the dope or lacquer.

Wet or dry sandpaper seems to be the one best bet for lacquer letters. On metal ships the benzol can be used also.—Denis O'Brien.

Borax Solutions

We are having trouble with borax not dissolving in our borax tank, in the pickle room. When borax is added to the tank, it apparently falls to the bottom and will not dissolve, although the water in the tank is boiling and is also agitated. Consequently the borax at the bottom of the tank has done considerable damage, and we are afraid in time it may ruin the tank entirely. We will appreciate any advice you may be able to furnish on this subject. —H. Mfg. Co.

It is evident that you are putting too much borax in the tank for the quantity of water; in other words you have an over-saturated

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solution. Only a given quantity of borax will dissolve in a given quantity of water and when more borax is added, the excess settles to the bottom of the tank.

In order to know just when you have a completely saturated solution you must first know just what the material is you are adding. There are four sodium borates, one of which is true borax. Varying amounts of each are required to make a saturated solution. It is very unlikely that you are using the sodium meta-borate $NABO_2$ hence I am not giving the solubility of this, although it is included in the above four sodium borates. For every 100-lbs. of water heated to the boiling point the following quantities will produce a saturated solution: 52.5-lbs. of sodium tetraborate $NA_2B_4O_7$; 99.1-lbs. sodium tetra-borate $NA_2B_4O_7 5\text{-}H_2O$; 201.4-lbs. of sodium tetra-borate $NA_2B_4O_7 10\,H_2O$ (true borax).

It is possible that you are using one of the first two sodium tetraborates instead of true borax and it may readily be seen that if you are adding the same number of pounds of either of these borates as would be necessary in true borax you would have an over saturated solution, hence a settlement of borax on the bottom of the tank.

A saturated solution of borax is sufficient for coating metal parts after they have been pickled and if the above quantities are used you should experience no further trouble.—P. C. Bardin.

Aircraft Finishing Problems
Corrosion

One of the big problems in aviation is to obtain maximum strength and minimum weight.

This problem is aggravated by the necessity for using thin-gauge material to secure minimum weight; by salt water corrosion of parts and by the failure of protective coatings used. No trouble is experienced from corrosion in inland sections, but in salt water sections the difficulty is pronounced. Corrosion is of two types: the pitting type affecting thin-gauge material, and intercrystalline corrosion.

The methods of attacking this problem of corrosion are the use of metals that do not corrode; chemical treatment of metals; deposition of coating; and by the use of organic film-forming materials. The qualities demanded of these methods are salt water resistance, abrasion or impact resistance, good flexibility; fastness of color and durability.—M. R. Whitmore.

Miskella Correction

In Mr. W. J. Miskella's article entitled "How to Measure Viscosity of Finishing Liquids," pages 11, 12, 13, and 14 of December INDUSTRIAL FINISHING, on page 14, in the second sentence of the second paragraph, the word "viscosities" should be "specific gravities," making this sentence read as follows: "However, for liquids having specific gravities between .75 and 1.5, which includes most finishing materials, a curve or chart has been worked out to convert the dial reading into c.g.s. units of viscosity."

Hercules' New Laboratories

According to a recent announcement from the Hecules Powder Co., Wilmington, Del., the company's new experimental laboratories, costing more than $500,000, which will house the research facilities of the Hercules Powder Co., are nearing completion, and will be formally opened within the next few months.

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Cleaning Spray Guns, Hose and Material Containers

By
JOHN H. HAMILTON

Experienced foreman finisher submits comments, suggestions and recommendations about the cleaning and maintenance of modern spray guns, hose and containers, and the straining of materials used in connection with spray finishing

THE PROPER use and care of finishing equipment will greatly lengthen the period of highest efficiency to be obtained therefrom. This is particularly true of spray guns and material hose. Much of the trouble that occurs in connection with finishing equipment is directly traceable to carelessness and inattention on the part of spray operators. This disregard as to cleanliness affects first the excellence of the finish and in a short time it leads to deterioration of the spray gun and hose.

Spray Gun Cleaning

To obtain the maximum service and results from spray guns, they should be thoroughly cleaned, dried, and oiled at the end of each day's work. Then they should be placed in a drawer or under cover over night. The oil will cover all parts of the gun, and it will be in good condition for service the next day.

When changing from one finishing material to another, it is advisable to clean both the gun and the hose by running the proper cleaning liquid through them and then force-drying them by attaching them to the airline.

The material hose should be taken down at the end of the day's operation and a suitable cleaning liquid should be run through it until it is thoroughly clean. After this is cleaned, it can be dried by connecting it to the airline and allowing compressed air to pass through it. When the material hose is due for a period of idleness, I always place it in a straight line full length on the floor, or in some protected place where it can remain in this position. This will prevent any of the dents or crevices so often caused when the hose is hung up or thrown down and left to lie in a twisted entangled condition.

Cleaning Hose Interiors

The material hose should be thoroughly cleaned before any period of inactivity, or otherwise the remaining material clinging in a thin film to its inner walls will dry, crack and flake off later

when the hose is again placed in service.

If varnish or varnish undercoats are being used, fill the hose with turpentine, plug up both ends and leave this material in the hose over night; next morning clean out the hose thoroughly and attach it to the airline. Regular observance of this precaution serve to prolong the useful life of the hose. Should the interior of the hose begin to peel, the logical remedy is to discard it and replace it with a new one, as it is very costly to remove these foreign particles from a finished surface.

Material Containers

All material containers should be kept exceptionally clean. When changing one material to another, the material container should be thoroughly cleaned; especially is this necessary when changing to or from lacquer, because after using lacquer, the faucets of all containers—whether air pressure or gravity pressure—will contain a small crust formed by the lacquer composition remaining inside the faucet—and of course, this retards the free flow of material.

All materials should be strained to save the time and trouble and expense that results from imperfections in the finish—those imperfections which necessitate the packing of "pulled-out" or "picked-up" places in the rubbing operation. Where metal strainers are used, they can be cleaned by dipping them into a suitable preparation and then air drying them. Cheesecloth is a good straining agent, as it can be used and then placed in a lye bath, dried and used over again several times. Cheesecloth is inexpensive, and it catches all particles of any appreciable size in finishing materials.

Rubbing machines also require care and attention and should be thoroughly cleaned and oiled at the end of each day's work. If neglected, they will soon show signs of running at reduced speed, and in a short time mechanical troubles are almost sure to develop.

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